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WORLD HEALTH ORGANIZATION

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HEALTH SERVICES IN THE USSR

As part of a plan to give public health workers first-hand experience of the organization and functioning of health services in countries other than their own, WHO arranged a special study tour to the USSR, in which 23 health workers of one kind or another from 21 countries throughout the world took part. This group spent more than five weeks in the USSR at the end of 1958 travelling about a great deal, listening to Soviet specialists, and seeing as much as possible of the country's health services. In the time at their disposal, the group did not—indeed, could not—see all that there was to see; and so some of the information incorporated in their report [1] is derived from government sources.

The health services of the USSR are organized to provide comprehensive medical care for the whole population free of charge, through curative and preventive services integrated at all levels. Planning and supervisory services are in general highly centralized, but executive services are decentralized, so that nine-tenths of all problems can be dealt with locally. The general administrative structure of the health services is shown in Figs. 1 and 2.

In addition to the ministries of health, the health departments, and the hospitals and clinics which they control, there are special institutions or bodies concerned with health. Thus the Academy of Medical Sciences acts as a centre for co-ordinating the work of a whole series of scientific research institutes scattered over the country as well as doing research itself. The scientific research institutes give post-graduate training to physicians, scientists and research workers. Councils of specialists advise the ministries of health and the larger health departments on methods of work and on suitable modifications in procedure. Medical education is the responsibility of medical schools and institutes for post-graduate training under the Ministry of Health.

Apart from administrative and finance departments, the health services throughout the USSR have three technical departments, responsible respectively for adult medicine, maternal and child health, and sanitary and epidemiological matters. Soviet medical scientists believe firmly that the child is not just a miniature adult, but a different being with different physiological functions, requiring a different approach. Paediatrics is therefore not a post-graduate specialty of general medicine, but a separate study for the undergraduate; the medical student must choose whether he will become a doctor for adults (known as a " therapist ") or a paediatrician. He may also elect to become a " hygienist ", and receive special training in preventive work. Hygienists staff the sanitary and epidemiological stations. They specialize in such subjects as epidemiology, municipal hygiene, or industrial hygiene, and fill posts usually occupied by sanitary engineers in other countries. All heads of health divisions or departments in the USSR are medical graduates, and all administrative work connected with health is performed by clinicians and specialists on a part-time or temporary basis.

Medical care in urban areas

The municipal or " rayon " hospitals each serve a population of 70 000-150 000, and not only have in-patient and out-patient facilities similar to those of other countries, but are responsible as well for curative and preventive services in the areas they serve. Their directors are the chief health officers in the rayons, and each has under him a specialist in epidemiology and sanitation (with the rank of deputy director), a general district out-patient service staffed by district doctors and nurses, a special screening system

[1] World Health Organization (1960) *Health services in the USSR* (*Publ. Hlth Pap.*, No. 3), Geneva

FIG. 1. THE ADMINISTRATIVE FRAMEWORK OF THE HEALTH SERVICES IN THE USSR

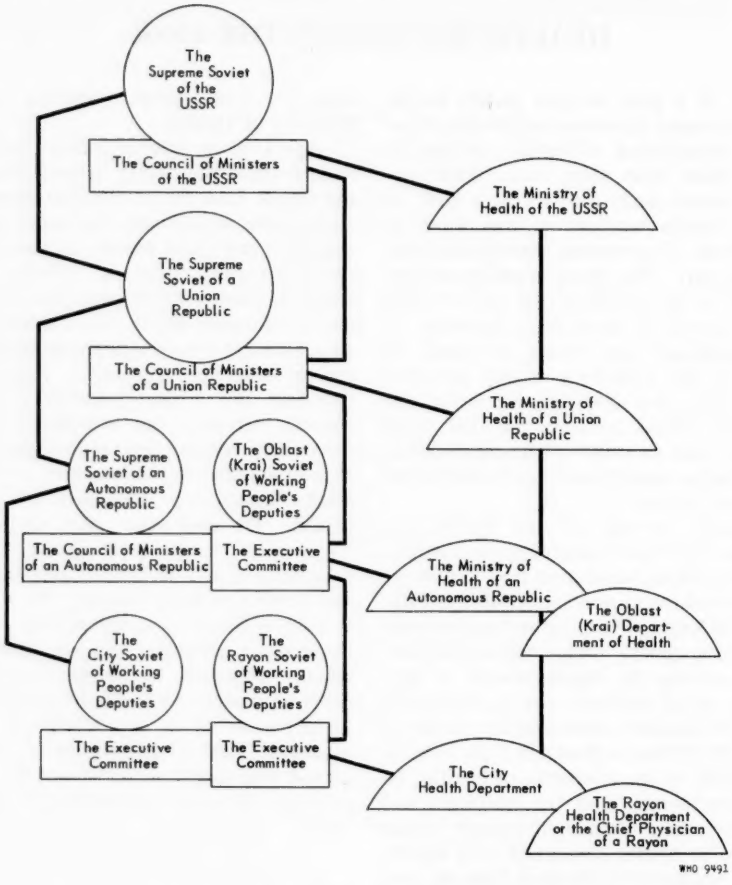

The Supreme Soviet of the USSR
The Council of Ministers of the USSR
The Ministry of Health of the USSR
The Supreme Soviet of a Union Republic
The Council of Ministers of a Union Republic
The Ministry of Health of a Union Republic
The Supreme Soviet of an Autonomous Republic
The Oblast (Krai) Soviet of Working People's Deputies
The Council of Ministers of an Autonomous Republic
The Executive Committee
The Ministry of Health of an Autonomous Republic
The Oblast (Krai) Department of Health
The City Soviet of Working People's Deputies
The Rayon Soviet of Working People's Deputies
The Executive Committee
The Executive Committee
The City Health Department
The Rayon Health Department or the Chief Physician of a Rayon
WHO 9491

FIG. 2. STRUCTURE OF THE HEALTH SERVICES IN THE USSR

for such groups of the population as children, pregnant women, and industrial or agricultural workers, and a follow-up system for known or suspected cases of certain diseases. Patients may be referred to central institutes, which have special laboratories, provide consultant services to the rayon hospitals, and promote and carry out research.

The rayon is divided into medical districts of some 3000-4000 inhabitants, each under a doctor and a nurse, who do not confine their activities to treatment but also look after sanitary and hygienic conditions, assisted by the staff of the sanitary and epidemiological station of the rayon hospital. The functions of the district doctors are on the whole wider than those of general practitioners elsewhere; they detect disease at an early stage, control foci of infection, supervise immunization, promote environmental sanitation, treat the sick, arrange hospitalization when required, organize auxiliary voluntary aid, and carry out health education programmes. They are based on the rayon hospital out-patient department, and work in hospital as well as outside.

FIG. 2. STRUCTURE OF THE HEALTH SERVICES IN THE USSR

The academy of Medical Sciences of the USSR
THE MINISTRY OF HEALTH OF THE USSR
Research institutes
Research institutes and higher educational establishments
Sanatoria and spas
THE MINISTRIES OF HEALTH OF UNION REPUBLICS
Chief physician of a rayon (who is at the same time chief physician of a rayon hospital)
Municipal and city health departments
THE MINISTRIES OF HEALTH OF AUTONOMOUS REPUBLICS (Oblast or krai health departments)
Rayon hospitals
Polyclinics
Hospitals proper
Sanitation and epidemiological department
Rural doctors' districts
Rural hospitals with out-patient clinics attached
Collective-farm maternity homes
Feldscher-midwife centres
Field first-aid posts and field sanitarian posts
Children's creches (permanent and seasonal)
Branch pharmacies
Health education centres
Oblast or republican hospitals
Oblast or republican out-patient clinics
City sanitation and epidemiological stations
Oblast or republican sanitation and epidemiological stations
Maternity homes with women's clinics attached
Oblast or republican research institutes
Oblast or republican sanatoria
Children's hospitals with children's clinics attached
Oblast pharmaceutical boards
Children's polyclinics not attached to children's hospitals
City pharmaceutical boards
Rayon Pharmacies
Children's creches
General and special sanatoria
Children's sanatoria
Pharmacies
Hospitals with polyclinics attached
Polyclinics (not attached to a hospital)
Special hospitals (ophthalmic, etc.)
Clinics attached to medical educational establishments and research institutes
Special out-patient clinics (tuberculosis, venereal diseases, etc.)
Medical and health departments at factories
Doctor and feldscher posts at factories
First-aid centres
SHO 9492

Medical care in rural areas

Medical care in rural areas is also based on integrated hospital and outside services (Fig. 3). As the rural areas are often sparsely populated and the distance from the base hospital is a problem, they have two additional units not found in urban areas: the district hospital and the "feldscher unit" (a "feldscher" is a medical auxiliary of limited responsibilities trained in a special school). A district hospital is usually a 25-30 bed unit serving a number of villages, and has out-patient services. Districts without hospitals have out-patient clinics, each staffed by a doctor and a feldscher.

In addition to the hospitals and out-patient clinics, every village and farming area has a feldscher post, which may be either a feldscher unit or a feldscher-midwife post, the type depending on the distance from the district hospital and maternity home. The feldscher-midwife post is provided with 2-5 maternity beds and a labour room. Both kinds of unit are under the direct supervision of the district doctor.

Medical care in industry

Nearly all large industrial concerns have their own medical units, each consisting of a hospital, an out-patient department, and a number of first-aid posts. The structure of a typical medical and health welfare department in a factory is shown in Fig. 4. Smaller establishments use the rayon or district hospitals.

Maternal and child health

Special importance is attached to the maternal and child health services which are carefully organized to cover preventive, clinical, educational, social, legal and environmental aspects. Mothers are trained in the details of child care at polyclinics, there being at present five separate courses relating to different age-groups of children. Maternity leave, to the extent of 56 days before and 56 after the birth of the child, must be granted; the post-partum period may even be extended to 70 days or more, if necessary for the mother's health. Nursing mothers are entitled to an additional period of absence of 3 months, if they so desire, without thereby losing any of the privileges attached to their work. Neither expectant nor nursing mothers can be compelled to give up work unless it is absolutely necessary for reasons of health.

In many areas of the USSR, all expectant and recently delivered mothers receive full antenatal and post-natal care. The general policy is that as many deliveries as possible should take place in hospital, and this goal has been largely achieved: in urban areas in 1957, for example, 100% of deliveries took place in institutions, in rural areas 80%. In that year the maternal death rate was 5 per 10 000 births. Deliveries in urban areas are carried out only by doctors, but in some rural areas trained midwives take the place of the doctors.

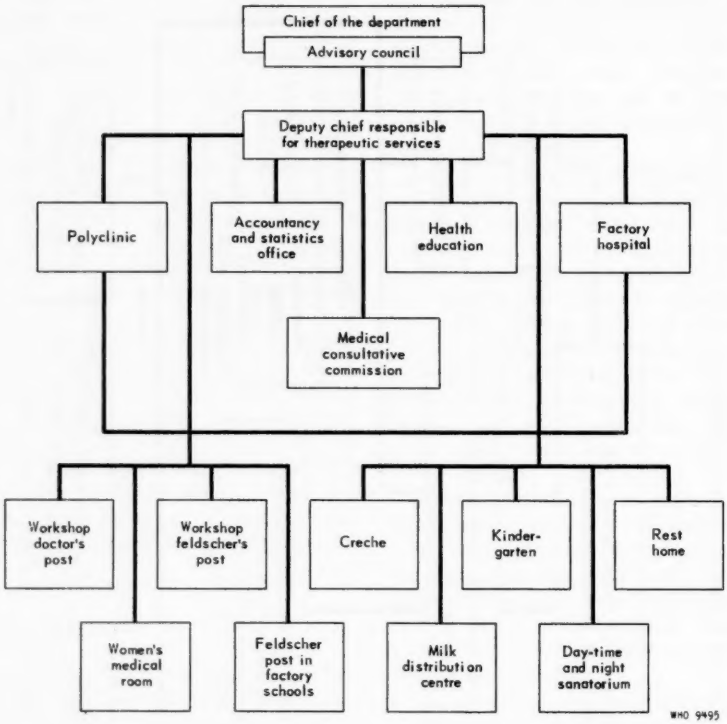
Health education is an important part of the expectant mother's preparation, and she is not only instructed in appropriate exercises but also in painless childbirth. Abortion has again been legalized, for social and economic as well as for health reasons, although it is not encouraged. No stigma is attached to unmarried mothers.

Paediatricians are available everywhere and supervise the child's progress from the cradle to the age of 16, doing home visits or providing preventive, health education and curative services at every polyclinic. Even the smallest hospital units in the USSR have paediatric wards. It is general policy that every Soviet child must be vaccinated against smallpox and tuberculosis, and he is usually also immunized against diphtheria and pertussis. Immunization against other diseases depends on local conditions, and also on advances in knowledge; vaccination against poliomyelitis has thus recently been introduced.

Permanent crèches are provided for children up to the age of 3 years. In some areas as many as 15% of children in this age-group attend them; some indeed stay in them all the time except at week-ends, when their parents take them home. There are also

FIG. 3. STRUCTURE OF A RURAL MEDICAL DISTRICT

FIG. 4. STRUCTURE OF A FACTORY MEDICAL AND SANITATION DEPARTMENT



seasonal crèches with beds, and a third of all beds in the sanatoria are reserved for children.

Research is constantly being carried out in the USSR on the physiology of pregnancy, embryonic and foetal development, the problems of the perinatal period, and the environmental factors which affect mother and child. Special institutes study the methodology of obstetric and paediatric practice.

Communicable diseases

The sanitary and epidemiological services are under a state sanitary inspectorate, with ramifications through regional and district departments and the network of sanitary and epidemiological stations down to the police (who carry out routine inspections) and to voluntary workers like those of the Red Cross and Red Crescent. The state sanitary inspectors and experts are virtually independent, their directives being mandatory unless repealed by their superiors. There are more than 5000 sanitary and epidemiological stations, which deal with environmental sanitation in all its aspects (even the hygienic quality of children's toys), the prevention, limitation of spread, suppression, and treatment of communicable diseases (including immunization and health education), and the organization of the sanitary and epidemiological work of the police and voluntary helpers.

Special follow-up treatment is an important feature of the control of disease in the USSR. Syphilis and the venereal diseases are always followed up in special clinics and out-patient departments; and in the event of an outbreak of malaria, brucellosis, trachoma or some other such disease a similar follow-up system may be instituted.

A result of these measures and of compulsory notification for certain diseases is that for years there has been no case of such major communicable diseases as plague, cholera, relapsing fever, typhus or dracunculosis. Trachoma, typhoid fever, leprosy and malaria occur only sporadically or in isolated outbreaks. And the morbidity rates for tuberculosis, cerebrospinal meningitis, and the venereal diseases have greatly declined. Helminthiasis remains an important problem, ascariasis still being widespread and hookworm occurring in some mining areas.

Non-communicable diseases

As in the USA and in most European countries, the two principal causes of death in the USSR are cardiovascular disease and cancer. Rheumatic fever receives much attention in the USSR: every polyclinic has a rheumatic fever department, concerned mainly with prophylaxis and treatment; every case is registered; a special ward in Moscow is maintained for research into this disease alone; all children are routinely screened, suspects being given prophylactic treatment; and active cases are not only hospitalized but are also intensively followed up when allowed home.

Prophylactic screening of the whole population for cancer has become a routine measure in the USSR, some of the people being examined at work, the others in special centres. There are 94 oncological clinics and dispensaries; their work is co-ordinated by the Herzen Oncological Research Institute at Moscow, an experimental and clinical institute with 250 beds, a laboratory, and many facilities for the study of cancer. Two institutes under the Academy of Medical Sciences carry out pure research in the field of cancer. All cases of cancer are compulsorily notifiable. The statistics show that cancer of the stomach is far and away the commonest cancer, being twice as common as cancer of the uterus and cervix, the next in frequency of occurrence.

Occupational health and diseases receive much attention, as befits a country in which the pace of industrial expansion is so great that industrial workers with their dependants amount to some 60% of the total population. There are 12 institutes of industrial hygiene and occupational diseases. These institutes help in the formulation of codes, rules and regulations for the protection of the workers' health; study industrial processes so as to devise new methods to safeguard their health even more effectively; act in a consultative capacity with regard to the diagnosis and treatment of occupational diseases; and engage in experimental and research work. The health units in large industrial establishments are usually of the type indicated in Fig. 4. They provide comprehensive medical care for the employees and sometimes for their families. Periodic physical examinations are carried out. Health education is given to the workers. Physiotherapy and physical medicine are practised on an extensive scale. Safety arrangements and first aid are highly organized. And workers requiring medical supervision are accommodated in day and night sanatoria called " prophylactoria ", staying in these during their free time but carrying on with their ordinary work. Every worker is entitled to four months' sick leave with full pay every year.

Sanatoria, rest homes, and health resorts

Sanatoria (which are institutions for the treatment and prevention of all kinds of diseases as well as tuberculosis), rest homes and health resorts have always been popular in the USSR. In 1955 there were 284 000 beds in sanatoria and 160 000 in rest homes. This would allow approximately one out of every 60 Soviet citizens to spend a month every year in a sanatorium. The authorities hope to be able to provide enough beds to enable 50% of the population to spend one month each year in one or other of these institutions.

No less than 10 scientific institutes carry out research into sanatorium and health resort therapy, the conditions investigated (and treated) ranging from cardiovascular and gastro-intestinal diseases to diseases of the female genital tract. There are chairs of balneology in the medical schools, and special graduate and post-graduate courses for workers in sanatoria and health resorts. More than 15 000 doctors and 35 000 medical auxiliary workers are employed in these sanatoria and health resorts, with one doctor on an average to every 50 sanatorium beds.

The sanatoria are usually well situated in the mountains or forest, or by the shores of a lake or the sea. Special forms of treatment include " hydro-aero-ionization " for hypertension, an elaborate balneological treatment for gynaecological and digestive disorders, and the ubiquitous " inhalatoria ".

Medical and paramedical training

To cope with this immense and complicated medical system the medical schools have been growing in numbers and size and producing an increasing number of graduates. These schools were under the Ministry of Education till 1930, but since then they have been placed under the Ministry of Health, and medical education is not, as it is in so many countries, a concern of the universities. The curriculum, as elsewhere, is extensive and varied. Only about a third of the applicants are accepted, the basis for admission being a qualifying examination. Feldschers and nurses with experience are encouraged to apply, and if they qualify satisfactorily in the entrance examination are given preference. The number of entrants each year is regulated according to statistics of the increase in population, the number of retiring medical officers, the needs of institutions, etc.

Outstanding students on qualifying go on as a rule to research and teaching institutes. The others usually go to peripheral health units for a period of 3 years; this period is compulsory, and a special board makes the postings. Account may or may not be taken of the graduate's expressed preference for a posting.

Eleven separate institutes, as well as most of the chief institutions of the Academy of Medical Sciences, cater for post-graduate education. There is a Central Institute for Post-Graduate Study in Moscow, and similar institutes in many of the larger cities of the republics. Graduates who wish to acquire the degree of Candidate of Medical Sciences are not admitted to post-graduate institutions until 3 years after graduation and then only if they pass another examination. They must then do 3 years of study under supervision and write and defend a thesis before they can be granted the degree. A still higher qualification is that of Doctor of Medical Sciences.

Special schools staffed by medical graduates train paramedical personnel—the nurses, feldschers, midwives, technicians and the like. All theory is taught by these medical graduates, but some of the practical training is given by senior paramedical personnel.

Other aspects of the health services of the USSR

Research receives special attention. The Ministry of Health of the USSR contains two bodies which deal with all technical and scientific problems: the Scientific Medical Council and the Academy of Medical Sciences. Of these the former keeps abreast of advances in medicine and advises the Ministry on their suitability for general adoption; it also furnishes advice to the scientific medical councils of the republics. The latter co-ordinates and supervises medical research in the whole Union, working in close co-operation with the Scientific Medical Council. The Academy contains three departments, of clinical medicine, medical biology, and epidemiology and hygiene, which control 27 central institutes of research. As well as these, there are institutes under the Ministry of Public Health, under the ministries of health of the various republics, and under the departments of health of the cities, regions and districts, all of which engage in research. Planning of research is done centrally, and one notable feature is the emphasis placed on the study of experimental pathology and of the physiology of the higher nervous system.

All the central research institutes are equipped with laboratories for elaborate investigations. Elsewhere the equipment is less complete, but even the sanitary and epidemiological stations have laboratory facilities for public health and epidemiological investigations.

The chemical industry of the USSR produces almost every type of drug required for medical purposes.

Health education occupies an important place in the Soviet system of medicine, and is one of the responsibilities of every doctor and of paramedical personnel. There is a health education division in the Ministry of Health under a chief inspector for health education, and a central research institute with additional training and supervisory functions. The republics have similar organizations. Locally the work is done by health education centres (of which there are 354 in the Union) and, where there are no centres, by the sanitary and epidemiological stations. Special health educators are attached to the staff of the more important institutions, the central research institute being in charge of their training. Health education is given to all age-groups, and the doctors attached to polyclinics are expected to devote at least 30 minutes every day to it during their domiciliary visits. Feldschers are responsible for health education in those areas where there are no doctors. Voluntary organizations play a leading part in educating the public, and every form of communication—posters, pamphlets, films, newspapers, television, radio—is extensively used.

Mental health does not appear to be so great a problem in the USSR as to warrant any special measures not familiar in other countries, and there are no special departments or divisions of mental health in the ministries of health. Psychiatric colonies for chronic cases have been set up on the outskirts of large towns and in rural areas, and many of the patients are employed, under supervision, by industrial enterprises and in agriculture. A method sometimes used, though not on a large scale, is to place mental patients with families. The usual mental hospitals exist, and there is an all-Union Institute of Psychiatry in Moscow.

The psychoses and alcoholism appear to be the chief mental disorders encountered in the USSR. The neuroses and the psychoneuroses are practically unknown, this being attributed by the authorities to the absence of unemployment in the country and the sheltered life led by the people. The introduction of penicillin for syphilis has reduced the incidence of luetic mental disease to a very low ebb. The number of beds for mental cases throughout the country is small, and the authorities do not think that many more are required. This is a very different situation from that obtaining in other countries.

Vital and health statistics are the responsibility of a special division in the Ministry of Health, and the republics have their own medical statistical departments with research bureaux attached. Medical students are trained in statistics, and short refresher courses are compulsory for all workers in the subject.

Research problem in air pollution

"Whereas exposure to unusual accumulations of higher concentrations of irritant pollutants can cause adverse health effects, long-continued exposure to lower concentrations of the same or similar materials may not necessarily be harmful. In fact, adverse health effects from such exposure have not been proved epidemiologically, except in a few isolated studies. However, rational medical and epidemiological concepts lead to the belief that this matter must be studied on a large scale in many selected places before definite conclusions can be reached."

. . . From the fifth report of the WHO Expert Committee on Environmental Sanitation (*Wld Hlth Org. techn. Rep. Ser.*, 1958, 157, 11)

RADIATION PROTECTION: INTERNATIONAL COLLABORATION

WHO, following in the steps of the United Nations, made a provision in its Constitution for consultation and co-operation with non-governmental organizations, recognizing in this way the experience, knowledge, and usefulness of these bodies, and the help they could give it in its work. For admission to what is called " official relationship " with WHO a non-governmental organization must be concerned with matters within WHO's competence, and pursue aims and purposes in conformity with the spirit, purposes and principles of WHO's Constitution. It must be of recognized standing, and representative of its particular field. It must have a directing body, and authority to speak for its members through its authorized representatives. Admission to official relationship is not granted lightly, but only after a careful scrutiny of the application by the Executive Board; and the question of maintenance or termination of the relationship is periodically reviewed.

When a non-governmental organization is admitted to official relationship it becomes entitled to appoint an observer to participate, without right of vote, in certain WHO meetings, and, on the invitation of the chairman, to address a meeting. It is given access to non-confidential documents, and to such others as the Director-General may in his discretion allow. It is entitled to submit memoranda to the Director-General, although the latter has the right to decide to what extent he will circulate them.

More than forty non-governmental organizations are at present in official relationship with WHO. One of these, of much topical interest, is the International Commission on Radiological Protection. An international protection organization in this field has existed since 1928, its main task before the Second World War being to recommend suitable safety measures for the use of X-rays and radium in medicine. X-rays had been in use since their discovery in 1895, and their dangerous effects had become known within a very short time, beginning with the most obvious, their effects on the skin (dermatitis, swelling, necrosis) and on the conjunctiva. The first case of cancer attributed to X-rays was recorded in 1902, the first death from such a cancer in 1914. Constitutional effects were noted almost as early as the effects on the skin. As the gamma rays of radium are more penetrating than X-rays, an added hazard from undue exposure to it is aplastic anaemia. Many casualties resulted from the use of X-rays and radium in the early years after their introduction, and the establishment of an international organization in 1928 to help bring some measure of standardization into the methods used to protect those who worked with them was by no means premature.

The Second World War brought the increased use of radionuclides and nuclear energy, which meant that the danger of exposure to ionizing radiation, hitherto small and limited mainly to the field of medicine, was much enhanced. Radioactive isotopes, essentially by-products of work on nuclear energy, are daily growing in importance in biology, medicine, and industry, and in time much of industry may depend on nuclear power. The dangers of radiation are thus becoming more widespread, and threaten not only those who work with radioactive substances but also those who come into contact with radioactive wastes and the radioactive fall-out of atomic bombs. The need for efficient safety measures to prevent the somatic and genetic effects of radiation is evident.

At the Sixth International Congress of Radiology in London in 1950 the former protection organization was transformed into the International Commission on Radiological Protection, and the scope of its work and the number of its members were greatly increased. In 1953 it produced its recommendations on the maximum permissible levels of radioactivity in the human body and

in the environment. Amendments published in 1958 did not materially change the occupational dose recommended but stressed the desirability of lower maximum permissible doses for long-term work and for population groups other than those controlled by radiation protection officers.

In 1957 the Commission presented recommendations to the United Nations Scientific Committee on the Effects of Atomic Radiation regarding the doses to different parts of the body (particularly the gonads) received by individuals and by large population groups through the use in medicine of ionizing radiations, and regarding methods of determining relevant dose values. It revised these recommendations also in 1958.

The International Commission on Radiological Protection functions under the auspices of the International Congresses of Radiology, its main objective being to make recommendations on radiation protection standards. It must therefore keep itself in touch with advances in the whole field of radiation protection. Its chairman and members are chosen on the basis of their recognized activities in radiology, radiation protection, physics, biology, genetics, biochemistry and biophysics, without regard to nationality. It has five committees at present, which deal with such subjects as the maximum permissible dose for external and for internal radiation, protection against X-rays up to energies of 3 MeV and beta and gamma rays from sealed sources, protection against electromagnetic radiation above 3 MeV and electrons, neutrons and protons, the handling of radioactive isotopes, and the disposal of radioactive waste. Some of these are subjects with which WHO is itself concerned; the Joint WHO/FAO Expert Committee on Methods of Radiochemical Analysis, for example, drew heavily on the work of the Commission.[1]

Knowledge of the harmful effects of radiation is generally thought to be remarkably incomplete, and so it is. The effects of the chemicals used in industry, however, and of the gases, smoke and dust released into the atmosphere, are little, if any, better known. But radiation effects are cumulative, and delayed. They may not be recognized as due to radiation because they are not specific. They cause genetic changes, supposed at present to be proportionate to the dose received and unrelated to the distribution in time of the irradiation. Although ionizing radiation can only be detected with special instruments, which often do not give the true maximum exposure of the relevant part of the body, there is nevertheless sufficient evidence that its harmful effects are greater than those of any other agent known to be injurious to the health.

The Commission's task of establishing sound maximum permissible levels of radiation is not an easy one, since knowledge of the effects of small doses and dose rates of ionizing radiation is so scanty. But the establishment of levels is essential, otherwise no advice on adequate protective measures can be given. This is the same situation as with other agents injurious to health: in most cases it is impossible to fix figures indicating the risks of harmful effects at different levels of exposure or to state with any degree of certainty a quantity below which any hazard is excluded. The Commission's method of fixing maximum permissible levels of radiation is to bring together people who have extensive knowledge and experience of the relevant biological effects and people who know the working conditions and possibilities of protection: in other words, people who can discuss the problem from every aspect.

In recent years the problem has become more complicated. The maximum permissible levels were formerly applied chiefly to persons exposed by their occupation to radiation; now the Commission is also concerned with the dose outside the area under the supervision of a radiation protection officer, and with the dose for the whole population. Other differentiations will probably become necessary; there may have to be different maximum permissible doses for an increased number of organs in the body and for the various kinds of population groups exposed, especially in regard to age and sex.

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1959, 173

Another non-governmental agency in official relationship with WHO is the International Commission on Radiological Units and Measurements (ICRU), established in 1925 under the auspices of the First International Congress on Radiology. It originally consisted of two members from each of the fifty countries taking part in the International Congresses on Radiology and its aim was to establish internationally acceptable units of radiation dosage. In 1928 it adopted the definition of X-ray dosage known as the " roentgen ", which made it possible for the first time to measure radiation in all countries in terms of the same unit. The ICRU was completely reorganized after the war, and its membership reduced to twelve persons in all, selected for recognized technical ability without regard to nationality. In 1953, at its seventh meeting, a new basic unit for the measurement of radiation dosage—the " rad " —was introduced. The ICRU entered into official relationship with WHO in 1956, and is now recognized by WHO as its body of technical advisers in the field of radiological units and measurements.

Increased knowledge of the effects of ionizing radiation on man is obviously needed. Much research has been carried out into this subject in the recent past, but progress is slow compared with the speed with which man-made sources of ionizing radiations proliferate and are likely to proliferate in the next few decades. Research to be effective must be international, and here there is scope for WHO, with its increased interest in all aspects of research. WHO proposes to carry out co-ordinated investigations in several countries into groups of people receiving radiotherapy so as to determine the incidence of radiation disease; for the number of patients in any one hospital or institution or in any one country is insufficient for a proper study. It also proposes a study on an international scale of patients receiving thorotrast, in order to obtain data on the long-term effects of small doses of ionizing radiation. Recent developments in dosimetry enable fairly reliable determinations of radiation doses received from thorium dioxide to be made. These can be correlated with the radiation effects induced in the patients and thus provide a basis for the quantitative assessment of the health hazards of low-level radiation exposure. Other inquiries WHO proposes to make are into the incidence and nature of genetic defects, the effects on the population in those parts of the world known to be exposed to high natural radiation,[2] and the effects on the foetus of low doses of radiation received at various stages of development. Only by systematic research, closely co-ordinated internationally, can the knowledge be acquired which will make it possible to safeguard the human race effectively from the harmful effects of ionizing radiations.

[2] See page 121.

" La fin des asiles "

Under this title, Hervé Bazin, the well-known French writer, has recently published a survey of mental hospitals in ten European countries. Written at the request of WHO, this publication * shows the immense advances that have been made in the treatment of the mentally ill, and how " . . . psychiatry has ceased to be a science of despair to become—in thirty years—one of the most humane and active branches of medicine ". It describes the advent of the " open-door " hospital and out-patient psychiatric services, reviews the mental disorders of childhood and old age, and deals at some length with the question of alcoholism—the cause or effect of a very high proportion of cases of mental disorder. After discussing the various bodies which seek to prevent personal, family and social conflicts (family and marriage guidance councils, institutes of human relations, industrial psychiatric services, etc.), Mr Bazin concludes his survey by stressing the fact that mental health is based primarily on the attitude of the individual and on his effort to understand others.

* Bazin, H. (1959) *La fin des asiles*, Grasset, Paris

HEALTH AND MORDIBITY IN THE SEYCHELLES

In 1953, the Government of the Seychelles asked for WHO's help in reducing the incidence of intestinal parasitic diseases in the islands. Although a population census had been taken in 1947 and registration of births and deaths was by then compulsory, no information was available on the general nutritional condition and health of the people, on the prevalence of diseases due to malnutrition, or on general morbidity.

It was therefore decided to make a general survey of health conditions in the islands, and especially of: dental and nutritional status; incidence of intestinal diseases and other easily diagnosed conditions; growth and weight curves for children up to the age of 16; haemoglobin levels and erythrocyte sedimentation rates and the relationship of these factors with one another and with general living and sanitary conditions such as housing, overcrowding, social status, and latrine arrangements; relationship between soil and water pollution and incidence of amoebiasis and helminthiasis; and, finally, incidence of the sickle cell trait, eosinophilia and positive serological reactions in the Chediak syphilis test.

The results of the survey, made in 1956-1957, are described in a paper by Dr A. J. W. Spitz,[1] which will shortly be published in the *Bulletin of the World Health Organization* and which is summarized below.

Characteristics of the country

The Seychelles are a group of 92 islands (of which only 40 are inhabited) in the Indian Ocean, situated between latitudes 4° and 10° South and about 1000 nautical miles from the coast of Africa. Their combined area is 405 km², and in 1956 the population numbered 40 000. The climate is damp, particularly along the coasts, and is influenced by the trade winds. Temperatures vary between 68° and 88°F.

When the French took possession of the islands in 1756, there was no indigenous popuiation. However, the settlers soon imported slaves from Africa and most of the present inhabitants are descended from them. Indian and Chinese merchants arrived in the nineteenth and twentieth centuries and most of the islands' commerce and trade is now in their hands.

Socially, the inhabitants are composed of a small minority of so-called " big planters " and a vast majority of poor labourers; there is a small middle class consisting of civil servants, a few artisans and small landowners. Apart from Victoria, the capital, there are hardly any urban areas, and each house is, practically speaking, a self-contained unit.

The principal occupations and sources of income are the growing of coconut palms and the production of copra and—on a smaller scale—cinnamon oil, quills, vanilla and patchouli. Rice and fish are the staple foods.

Malaria, leishmaniasis, yellow fever, sleeping sickness, yaws and bilharziasis are unknown in the islands. In 1957, there were 50 cases of leprosy and 100 of tuberculosis. There are epidemic and sporadic outbreaks of whooping-cough, diphtheria, measles, chicken-pox and influenza. At one time the venereal diseases were of major concern but they are now in regression. Intestinal diseases are the chief public health problem, in particular the helminthiases and various types of protozoal infection (amoebic dysentery, giardiasis and balantidiasis).

Organization and scope of the survey

The scope of the survey was limited by the personnel and laboratory material available. The field work was done mainly by a physician and a laboratory technician: the first was responsible for organization and direction of

[1] Public Health Administrator, WHO Regional Office for Africa, Brazzaville, Republic of the Congo; formerly Senior Medical Officer, WHO Team, Seychelles

the work and for administrative matters, and the second was required to collect and examine blood, stool, soil and water specimens. The only auxiliary personnel available were inspectors and local public health nurses who helped only in their respective districts.

It was decided to study a population sample of 5000-6000 people. In the absence of population registers, the house was adopted as the sampling unit and one house was sampled out of every seven. All the subjects were examined in their own homes. In all, 984 houses were sampled with 5766 inhabitants, of whom 5587 were examined. Each " surveyee " was handed a waxed cardboard container for a stool specimen, to be presented on the day of the examination.

The physician noted the following particulars in each case: age, height, weight, nutritional condition, signs of malnutrition, state of teeth. In the clinical examination, all easily diagnosable conditions were recorded and in particular: pulmonary and cardiac abnormalities; bronchial asthma; inflammatory and degenerative conditions of the eyes (follicular conjunctivitis, pterygium, pinguecula, arcus senilis, cataract, etc.); hernia; uterine fibroids diagnosable by abdominal palpation; cutaneous and subcutaneous infections; mycotic infections of the skin; diarrhoea; pregnancy. Note was also taken of the ethnic group to which the subjects belonged, of female fertility, of social status and of sanitary conditions in the household concerned, including overcrowding, if any, and latrine arrangements.

The laboratory technician made the following examinations: blood (haemoglobin, erythrocyte sedimentation rate, parasites and eosinophilia, sickle cell trait, Chediak test); stools (*Entamoeba histolytica* trophozoites and cysts, *Giardia lamblia*, *Balantidium coli*, hookworm eggs and larvae (*Ancylostoma duodenale* and *Necator americanus*), roundworm eggs (*Ascaris lumbricoides*), *Strongyloides stercoralis* larvae, whipworm eggs (*Trichuris trichiura*), pus and red blood cells); soil (examined for worms' eggs, larvae and amoebic cysts); water (the same examinations as for soil samples). No bacteriological investigations were made.

General data

The survey showed that young people predominate in the Seychelles population, 52% of the inhabitants being under 20 years of age. In the lower age-groups, males are more numerous, whereas females are more numerous among the adults. The racial distribution is as follows: 20.2% Caucasians (European); 61.1% Africans; 3.7% Indians; 2% Chinese; and 13% ill-defined races. The pregnancy rate was found to be 46 per 1000 population. The neonatal mortality rate (under one year) and the infant mortality rate (under five years) were respectively 67 and 90 per 1000 live births in 1956-1957. The miscarriage and stillbirth rate was very high.

Nutritional conditions

The classification of the inhabitants as " obese ", " normal ", " thin ", and " emaciated " gave the following results: obese, 9.1%; normal, 40.4%; thin, 41.8%; emaciated, 8.7%. If the obese and normal are combined into a single " well-fed " group, and the thin and emaciated into a single " under-fed " group, an almost exact 50:50 balance is obtained. More than 27% of the subjects examined showed signs of malnutrition. The highest percentage of disorders caused by malnutrition was found in the 5-9 age-group which was also the group with the highest infection rate. In fact, the malnutrition curve was remarkably similar to the ascariasis curve up to the 20-39 age-group, and to the multiple parasitosis curve at all ages. As a rule the degree of malnutrition was not serious and this may be attributed to the fact that the basic diet (fish and rice) is not seriously lacking in nutritional elements so that it may be concluded that the nutritional disorders are caused by intestinal parasitism.

Haematology

The percentage distribution of haemoglobin levels was as follows: less than 50, 0.0; 50-59, 0.2; 60-69, 1.4; 70-79, 15.5; 80-89, 54.6; 90-99, 28.1; +100, 0.2. The haemoglobin level tends to increase up to the 20-39 age-group and then to fall until it reaches in old

age about the same level as in infancy. This does not tally with the increasing frequency of ankylostomiasis as age advances nor with the data on nutritional disorders and malnutrition. The rate of erythrocyte sedimentation is relatively high in the 1-4 and 5-9 age-groups.

Dental health

The dental condition of the population varied considerably from one zone to another. One remarkable finding was that the inhabitants of West Mahé, who have the worst living conditions and the highest rates of malnutrition and intestinal parasitism, had better teeth than the other islanders.

Environmental sanitation and social status

The survey showed that only 4.5% of the population enjoyed good social conditions and that three-quarters of them lived in definitely bad conditions. Of the houses, 16% could be considered as " good ", 27% as " fair " and the rest as " bad "; 12.5% of the inhabitants had a living space of 4.5 m^2 or more per person; 25.6% had 2.3-4.4 m^2, and 61.9% had less than 2.3 m^2. Of the latrines, 16.7% were " good ", 27.2% " medium " and 56.1% " bad ".

Presence of intestinal parasites

Of the stools examined, 93.3% contained parasites, the age-group distribution being as follows: under one year, 21.8%; 1-9 years, 95.3%; 10-19 years, 97%; 20-39 years, 95.7%; 40-59 years, 93%; over 60 years, 92.8%. The multiple infection index (average number of different parasites per infected person) was 2.26. Trichuriasis and ascariasis reach their peak in the 5-9 age-group but, while ascariasis then drops steeply from 78.4% to 43.2% in old age, trichuriasis, although declining slightly, remains at 86% in old age. Ankylostomiasis increases steadily from childhood to old-age (1.8%-35.3%); strongyloidiasis follows a very similar curve although its incidence is considerably less, with a decrease after the 40-59 age-group.

Incidence of amoebiasis (*Histolytica*) tends to increase with age, and giardiasis reaches its maximum incidence in the 1-4 age-group, after which it gradually decreases with age. There is no marked difference in the parasite rate as between males and females.

The soil samples taken near the houses showed that 23.5% of the inhabitants were living in areas where the soil was contaminated with intestinal parasites. The ground near 984 houses was examined from this point of view with the following results: roundworm eggs were found in 133 soil samples; whipworm eggs in 42; *Strongyloides* larvae in 50; and hookworm larvae in 7. This made a total of 232 houses with polluted soil. In this connexion it was found that the cause of the high degree of soil pollution was the widespread use of chamber pots, for although these vessels are emptied into the latrine, they are washed out near the house and the swillings are poured into the yard.

Other pathological conditions

Incidence of diarrhoea was found to be highest in the 5-9 age-group. This group was also the most affected by asthma, which appears to indicate some relationship between this disorder and helminthiasis seeing that the same group shows the highest incidence of ascariasis and the highest index for multiple intestinal parasite infection. Pathological conditions of the heart appear to increase with age, which is not surprising. Pulmonary diseases reach one peak in the 5-9 age-group and another in old age. There is a steady increase in mycotic infections of the skin from 0.9% among infants to 18.7% in the 20-39 age-group. In the lowest age-groups there is high incidence of hernia (mainly umbilical hernia) and of pathological conditions of the eyes. One noteworthy feature is the frequency of degenerative eye diseases (pinguecula and pterygium) in young persons. There appears to be a rather high rate of uterine fibroids (3% among women of 20 years and over).

THE PROBLEM OF WATER SUPPLIES

If public and domestic water supply programmes continue to be carried out in the countries of Latin America at their present rate, it will take 50 to 100 years for the needs of about 75% of the population to be covered. The problem is mainly an economic one and its solution involves finding some way of investing capital profitably in public works of this type. In an article recently published in the Boletín de la Oficina Sanitaria Panamericana [1] *and summarized below, Dr A. Wolman makes an objective study of the extent of the problem, its repercussions on public health, and its possible solution.*

The Pan American Sanitary Bureau (PASB) which serves as the WHO Regional Office for the Americas, has collected data on the availability of water to the inhabitants of certain countries of Latin America. Despite the inadequate and defective nature of the information available, it has been possible to ascertain to what extent the population is without water supply services in a certain number of countries.

Some 182 million people live in the countries covered by the PASB survey. Of these, 75 million live in towns with 2000 inhabitants or more. In 1958, 39 % of the inhabitants of these urban areas, i.e., 29 million persons, were without piped water. Towns of 50 000 inhabitants or more had the best services, but frequently more than 25 % of the population did not have an adequate and convenient water supply.

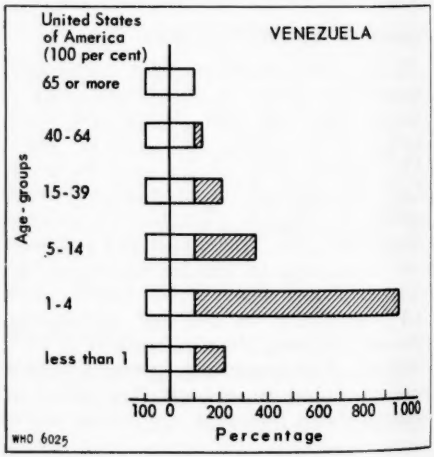
Almost 50% of residents in towns with 10 000 to 50 000 inhabitants and 70% of residents in towns with 2000 to 10 000 inhabitants are in the same position. In fact, some large towns have no piped water supply whatsoever. The situation has been aggravated by the rapid growth of the towns.

Some 107 million persons not classified as town dwellers live in communities of less than 2000 persons or in rural areas. Of these more than 70% are without a piped water supply, though many live in communities sufficiently densely populated to require one.

Effects on health

The estimated mortality rates for all ages vary between 15 and 20 per 1000 inhabitants, although in the majority of countries surveyed there is no full record of such data. The figure reproduced below clearly shows the great difference in the mortality per age-

GENERAL MORTALITY RATES IN VENEZUELA EXPRESSED AS PERCENTAGES OF MORTALITY RATES IN THE UNITED STATES OF AMERICA



[1] *Bol. Ofic. sanit. panamer.*, 1959, 47, 375. The article was used as a basis for the technical discussions at the eleventh meeting of the Directing Council of the Pan American Health Organization (eleventh session of the WHO Regional Committee for the Americas), held in Washington, D. C. in September 1959.

group between a country like Venezuela and the United States of America.

It is clear that mortality in early infancy is excessive. For children aged from 1 to 4 years, diarrhoeal diseases represent the main cause of death in 12 out of 17 countries. In the others, the diarrhoeal diseases figure among the five main causes of death. The rates of mortality from typhoid, gastritis, enteritis, etc. are very high in many of these countries.

In general, it appears that a reduction of from 30% to 60% in diarrhoeal diseases may be expected if drinking-water is supplied in an accessible form and in adequate amounts. The high mortality from these diseases is but one of the many consequences of lack of water supply.

Paying for water supplies

The installation of water supply systems requires large capital investments, and this has given rise to considerable anxiety in the minds of many public health administrators. A proper understanding of means of amortization should, however, help to overcome their fears. The amount of capital necessary is less important than the annual interest and amortization payments. In many cases these can be met without straining the normal resources of the communities concerned, although there is a strong feeling, on the part both of the public and of some sanitarians, that water should be supplied to all free of charge. However, by adopting the principle of complete or almost complete repayment, certain communities have shown that the public can be persuaded to accept the obligation of paying for their water. The acceptance of this principle is essential to the success of the programme.

At present, the revenue of most water supply services in Central and South America hardly ever covers the interest and amortization costs. It is rarely, in fact, enough to defray the annual cost of maintaining and running the service. Consequently the public health official is confronted with the task of convincing governments and the public that the water supply service must be run on a commercial basis. People must be persuaded to give up the idea that a merchandise whose production and distribution costs money should be as free as air. When a housewife has to go a considerable distance to buy a small jug of water in the market place, it very often costs her ten times more than she would ever have to pay for drinking-water piped to her own home. Yet piped water is expected to be supplied free.

Taxes on real estate and revenue from other sources have been used in the Latin American countries to finance the supply systems. However there are very few cases in which this fully covers amortization of the capital as well as maintenance and running costs.

International financial corporations rarely grant large loans for community water supply services. This does not mean that they would not be available under certain conditions, i.e., if clear proof is given of the economic soundness of the purposes for which they are intended, as well as the existence of a more than reasonable probability of repayment, and if it is shown that the maintenance and functioning of the service will be covered by the revenue from suitable charges.

Nevertheless, even should such loans be available, it is preferable to develop and use local sources of finance, on the principle of repayment and self-supporting services. It is particularly important to recognize that the extension of water supply services in Latin America must be based on the maximum utilization of local resources in manpower, materials and money.

Each of the countries concerned should establish as soon as possible the most suitable type of organization to plan and carry out a national water supply scheme with the available resources and should promulgate the appropriate legislative measures.

Simultaneously, an inventory should be made of available water supply services and of communities classified according to size. Priority should be given to the largest communities urgently in need of such services and presenting the fewest obstacles to immediate success. An estimate should be made of the cost of the services in each of the

areas selected and a system of charges prepared that will meet the interest on and repayment of the loans, as well as the costs of maintenance and possible extension.

It is important to prepare and distribute publications designed to convince the public of the value of the service and the moderate nature of its cost.

Attention must be paid to training personnel if continued success is to be ensured. Training of specialized personnel may perhaps be carried on permanently, for the towns will increase in size and new problems arise.

The important function of giving guidance for the training of officials in the administrative, financial and technical aspects of the programme devolves on PASB/WHO and the United States International Cooperation Administration (ICA).

PASB ZONE OFFICE FOR CENTRAL AMERICA *

The system of Zone and Field Offices established some eight years ago by the Pan American Sanitary Bureau (PASB), which acts as the WHO Regional Office for the Americas, has proved to be an effective way of achieving close co-operation between PASB and the health authorities of Member States. One of these Offices has been located in Guatemala since 1943—first as an Area Office, and later as the Office for Zone III. Its work is described in the article that follows.

The Zone III Office of PASB in Guatemala City collaborates with the governments of Central America, including British Honduras and Panama (see map), for the improvement of their health services, mainly through the development of local public health services. For this purpose, action is started in selected localities which provide training facilities for workers who than serve in other areas when the programme is extended. This eventually leads—as is now the case in El Salvador, Guatemala, Honduras, Panama and British Honduras—to the reorganization of health services at the national level.

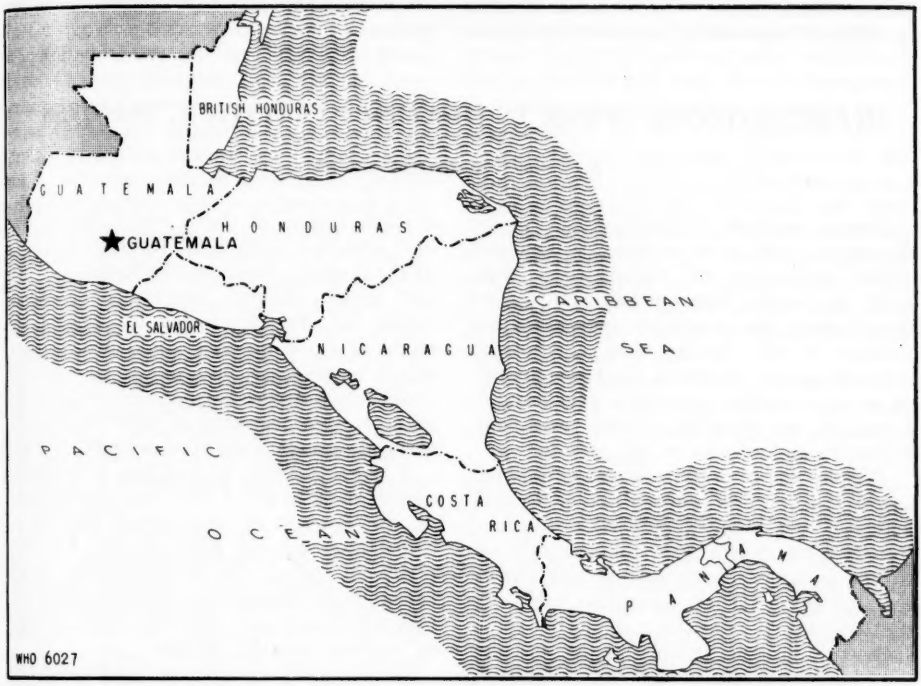
The governments of the countries in Zone III continue to give priority to malaria eradication programmes. Of the Zone's 538 570 km², 437 260 km² are considered as malarious, and this area contains 6 600 000 inhabitants, i.e., 57% of the Zone's total population. By the end of 1958, El Salvador and Guatemala were in their third year of insecticide spraying; British Honduras had by then completed its second year; Costa Rica and Panama were in their second year; and Honduras had completed its first year. Nicaragua started spraying operations in 1958. There have been increases in technical advisory services and in the provision of specialists for malaria work in the different countries; 38% of the fellowships awarded in the zone in 1958 were for training in various aspects of malaria eradication.

Since 1956, the presence of *Aëdes aegypti* has not been recorded in Zone III. Nicaragua, Panama, the Canal Zone, and British Honduras have been declared free from the mosquito. By the end of 1958, final verification of the position was completed in Guatemala and was proceeding in El Salvador and Honduras, and it was hoped that it would shortly be possible to announce the eradication of *A. aegypti* from those countries.

Tuberculosis control is still receiving special attention in the Zone. Intensive BCG vaccination campaigns were carried out in 1958 in Guatemala and Honduras; in the two coun-

* Adapted from an article published in *PAHO Quarterly*, 3, No. 3, 16. An article on activities in Zone I appeared in *Chron. Wld Hlth Org.*, 1958, 12, 400, and one on activities in Zone II in *Chron. Wld Hlth Org.*, 1958, 12, 304. In addition, a note on PASB activities along the Mexico-USA frontier appeared in *WHO Chronicle*, 1959, 13, 270.

ZONE III (CENTRAL AMERICA)



tries together, more than 3 million persons were tuberculin-tested and nearly 2 million vaccinated.

Oral vaccination against poliomyelitis, using attenuated live virus, was started experimentally in Nicaragua in 1958. The Office supplied the vaccines and laboratory equipment and gave the necessary technical advice.

In Panama and El Salvador there has been great progress in rural environmental sanitation activities carried out as part of integrated health programmes, notably as regards water supplies, sewage disposal and the installation of baths and wash-basins. In Guatemala and Honduras progress has been made in the organization of sanitation programmes, and in the former there have been notable improvements in urban water supplies. All countries in the Zone are paying special attention to the training of sanitary inspectors, and to the provision of adequate supplies of pure water.

The main work in connexion with the zoonoses and with veterinary public health has been the organization of central or local services and the training of specialized and auxiliary personnel in some countries.

The Zone Office has done everything possible to promote the organization of training facilities for public health personnel. In 1958, training courses were provided in El Salvador, Guatemala, Honduras and Panama, and by the end of the year 355 health workers had completed their training, including 21 physicians, 61 nurses, 76 sanitary inspectors and 160 auxiliary nurses. The need for this personnel reflects the development of

the regional and national health services. In 1958, 20 fellowships were awarded for general public health studies, 33 for regular courses in different specialties, and 66 for special courses, seminars, and study and observation tours. The result has been an increase in the proportion of specialized personnel of all grades in the Zone.

INTERNATIONAL WORK IN HEALTH STATISTICS, 1948-1958 *

8. Cancer statistical studies

Cancer research is taking place on an impressive scale in a number of countries. Many institutions and organizations, especially in North America and Europe, are investigating the causation, prevention and therapy of the disease, and all possibly relevant factors. Research has been stimulated in turn into the very fabric of life and its processes, as revealed in the physiology, chemistry and physics of cell growth.

The conduct of cancer research is generally costly and complex, and so limited to well-endowed and highly organized institutions. Realizing that WHO could not materially add to the volume of laboratory and clinical research being carried out in this field, even if it devoted a large share of its budget to such work, the Interim Commission, and later the First World Health Assembly, decided to concentrate on cancer statistics, where WHO's position as an international organization could be made use of in the standardization of the nomenclature and classification of tumours and in the development of ways of assessing incidence and prevalence.

Following a suggestion made by the WHO Expert Committee on Health Statistics in 1949,[1] the Second World Health Assembly established a Subcommittee on the Registration of Cases of Cancer as well as their Statistical Presentation. Meeting in March 1950,[2] this Subcommittee discussed the difficulties of defining cancer in terms of the International Classification of Diseases, Injuries, and Causes of Death; of tabulating multiple causes of death where cancer was one; and of obtaining an accurate diagnosis of the disease. National committees on vital and health statistics should, the Subcommittee felt, be encouraged to sponsor the study of these problems, and also geographical variations in mortality from cancer of specific anatomical sites, as well as to determine the total incidence of cancer in populations of sample areas over selected periods, and where feasible to institute a follow-up system so as to arrive at a true survival rate. In the absence of any agreed method of calculating survival and apparent recovery ("cure") rates, the Subcommittee made certain recommendations and proposed certain definitions and rules that were designed to produce standard returns.

Another Subcommittee on the Registration of Cases of Cancer met in September 1951,[3] and, after discussion of the general principles that should govern the statistical classification of neoplasms, agreed that such a classification should distinguish between the anatomical site, the histological type, and the degree of malignancy. To provide adequate flexibility and ease in coding, a separate classification in respect of each of these three aspects was required. The Subcommittee accordingly drew up a classification of neoplasms according to anatomical location, for general use in cancer registration and morbidity statistics. This classification was based upon the International Classification of Diseases, Injuries, and Causes of Death, but contained modifications to provide for a strictly anatomical classification where grouping on a histological basis was found in the International Classification.

* The earlier parts of this account of WHO's work in international health statistics appeared in *WHO Chronicle*, 1959, **13**, 67, 214, 253, 378, 417, 446; 1960, **14**, 66.

[1] *Wld Hlth Org. techn. Rep. Ser.*, 1950, **5**

[2] *Wld Hlth Org. techn. Rep. Ser.*, 1950, **25**, 17

[3] *Wld Hlth Org. techn. Rep. Ser.*, 1952, **53**, 43

The Subcommittee did not embark upon any classification of cancer according to histological type or degree of malignancy. In the former case there was lack of uniformity in histological terminology, and in the latter there was considerable disagreement concerning the concept of pre-malignancy. Nevertheless, the American Cancer Society's *Manual of Tumor Nomenclature and Coding*,[4] which the Subcommittee regarded as the first serious attempt to prepare a histological code for statistical studies, was recognized as an important advance towards the development of a standard histological classification of neoplasms. The Subcommittee therefore recommended that it be distributed to national organizations for study, and, if possible, for trial, with or without modifications. Their experience in its use and their views on its applicability would materially assist WHO in its preparation of a standard classification according to histological type and to degree of malignancy.

Various international and national organizations had made attempts to classify cancer according to stage. The Subcommittee reviewed their work, and briefly outlined the principles that should govern any such classification. While recommending the system for staging of cervical cancer adopted at the International and Fourth American Congress on Obstetrics and Gynecology, it expressed the view that any future revision of that system should bring it into conformity with those principles.

In 1956, the Expert Committee on Health Statistics returned to the subject of classification of neoplasms by site, histological type, and stage.[5] It recommended that WHO expand the publication of statistical studies on the various types of cancer, increase the distribution of information on the statistical methodology applicable in the field, and continue its efforts to improve the classification of cancer, in co-operation with the appropriate professional organizations. In order to assess the results of treatment, the maintenance of cancer registers was essential; WHO should therefore keep the different systems and methods of cancer registration constantly under review, so as to ascertain how that could best be done. Since a Subcommittee on Cancer Statistics had last met a number of cancer registers had been set up throughout the world. International co-operation, under the auspices of the International Union against Cancer, had been achieved in the compilation of a statistical code of neoplasms, classified histologically. Progress had been made in the classification of cancer according to degree of malignancy. Various techniques had been developed for the assessment of the incidence and prevalence of cancer. And more statistical studies on the etiology of cancer were being carried out.

A Sub-Committee on Cancer Statistics met in December 1957.[6] It had before it a resolution[7] of the Tenth World Health Assembly on the epidemiology of cancer, which requested the Director-General of WHO to pursue the collection and publication of the relevant mortality and morbidity statistics; to continue to seek acceptable international definitions and an agreed statistical classification; to provide a centre to give advice on the objectives and methods of cancer registration; and to consider the desirability and urgency of co-ordinating and expanding work on cancer epidemiology and statistics, in order to contribute more effectively to national needs through improved international liaison.

The Sub-Committee agreed to define " incidence " as the number of new cases occurring during a stated period of time in a given population, and " prevalence " as the number of cases current in a given population, either at a given point of time—e.g., on a given day (" point prevalence ")—or during a stated period (" period prevalence "). The statistical unit should be indicated: either " persons " diagnosed as having cancer, regardless of whether they have more than one primary cancer; or " cases ", in which each primary site is counted separately. The proportionate distribution of cancer, i.e., the relation of different forms to the total number of cancer cases, is occasionally useful, particularly when

[4] American Cancer Society (1951) *Manual of tumor nomenclature and coding*, New York

[5] *Wld Hlth Org. techn. Rep. Ser.*, 1957, **133**, 14

[6] *Wld Hlth Org. techn. Rep. Ser.*, 1959, **164**, 27

[7] *Off. Rec. Wld Hlth Org.*, 1957, **79**, 26 (WHA.10.18)

no population denominator is available, and often too as a supplement to rates based on populations.

The Sub-Committee discussed the value of statistics of incidence and prevalence in the organization of medical care, in cancer control and in epidemiological research. Mortality statistics cannot provide differential survival rates for the various kinds of cancer, but are nevertheless a useful source of information. Compulsory notification, on the pattern of that for communicable diseases, has the disadvantage that the minimum amount of useful information required about each cancer case is considerably more than that normally obtained about a communicable disease; but it does provide information which, because of its confidential nature, might not otherwise be obtainable. National cancer registration could only be effective in small countries; in large ones it is doubtful whether the amount of work needed to keep track of all cases is justifiable merely to obtain incidence and prevalence statistics. Surveys of the *ad hoc* type carried out in the United States and in France, or as a by-product of general morbidity surveys, are a distinct possibility. Other sources, such as social security statistics, records of absenteeism, and general practitioners' records, are usually inadequate. On the whole, the Sub-Committee concluded, any investigation not specifically adapted to cancer does not supply the information required.

Linked with the difficulty of obtaining reliable statistics is the question of when cancer actually starts. In most morbidity studies a case of cancer dates from its first diagnosis, but this is not wholly satisfactory from the standpoint of statistics of incidence. The Sub-Committee accordingly recommended that countries recording the date of onset of the first symptoms in their registrations should carry out experimental studies to determine whether the adoption of the onset of symptoms as the starting point of the disease would offer any advantage in such statistics.

Unusual incidence, taken with dietary and other habits and environmental conditions in under-developed communities, might shed light on the etiology of malignant neoplasms. In such regions, therefore, joint schemes of cancer diagnosis and of registration of population and vital statistics might be established in selected areas.

The Sub-Committee then discussed cancer registration as a system of maintaining a centralized register covering patients from a whole country, state or other well-defined large area. This system has begun to be instituted widely throughout the world as a means of providing valuable statistical information on cancer. A cancer register affords a means of assessing the results of treatment, comparing the effectiveness of various forms of treatment, computing rates of survival, studying the etiological and pathogenetic aspects of cancer, and indicating methods of control and medical care. There are several ways of starting a register, depending on the purpose it is meant to fulfil. Points that deserve note either in starting or in maintaining such a register are its scope, the anatomical sites to be covered, the sources of the data, the items of information to be collected, who should be in charge of the register, how the data should be utilized, the register's role in general cancer research, and the use of the register in under-developed countries.

Next, the Sub-Committee discussed the epidemiology of cancer, laying stress upon the value of statistical methods in the study of cancer etiology. It ended its session with a group of recommendations: that WHO continue publication of reports on cancer mortality, publishing rates by sex and age and examining the question whether some form of standardization could be applied as regards rates for all ages; that it investigate as far as possible the major apparent differences in mortality between countries; that it publish a study on the epidemiology of cancer and cancer registration systems; that it co-operate with interested organizations on field studies of cancer; that it again draw the attention of countries to the definitions and rates the Sub-Committee had earlier recommended; that a preliminary study be undertaken of problems of classification of neoplasms, which would take into account current developments in their histological classification; and

that studies continue on the extent to which diagnoses of malignant tumours upon death certificates can be accepted as reliable.

Special studies

A number of special statistical studies of cancer have been made by WHO. In 1952 the evolution of cancer mortality in Europe during the twentieth century was described in the *Epidemiological and Vital Statistics Report*.[8] Stress was laid on the degree of caution needed in examining international statistics of cancer mortality, and a strong appeal was made for fuller statistics, especially through extension of the cancer registration system, to help in the elucidation of many obscure points in the epidemiology of cancer.

This study revealed inexplicable differences in the mortality from malignant tumours in various countries: differences which inevitably suggest that more accurate recording and more careful inquiry into the relevant factors are required. It showed, however, a distinct rise in cancer mortality among the older age-groups in all countries, particularly from neoplasms of the respiratory system. It also showed that, although mortality from cancer of the uterus had on the whole been stationary, there was a definite increase in deaths registered as due to cancer of the breast in females.

The interest in the marked increase of respiratory neoplasms and in the possible causative or correlative relationship of such factors as smoking led in 1955 to the publication by WHO of available international data in tabular form,[9] and to a further mortality study in the *Bulletin of the World Health Organization*.[10]

In view of the heterogeneous character of the data, the study was guarded in its conclusions, but it found an increase in mortality from lung disease in all the countries reviewed, attributable mainly to the increased number of tumours of the trachea, bronchi and lungs. Although it is not entirely clear what proportion of the recorded increase should be attributed to improved diagnosis, there is nevertheless no doubt that in a significant number of countries of the world today cancer of the lung has become an important medical problem requiring intensive epidemiological research.

In response to current interest in mortality from Hodgkin's disease and leukemia, WHO, also in 1955, compiled tables from the available records.[11]

Another statistical cancer study in the *Bulletin of the World Health Organization* in 1956 [12] reviewed the trends of female mortality from cancer of the breast and genital organs, as shown by the data available to WHO. Here again, marked differences in the rate of mortality were found to occur in the countries included in the survey. These uncertainties confirm the need for fuller statistical research into the exact prevalence of the different neoplasms country by country and area by area, and into possible correlative and causative circumstances.

Pathological reference centres

The question of the classification of neoplasms was raised again by a WHO consultant group in 1955.[13] It suggested that WHO convene groups of specialists on the various types of cancer in which the histological picture and nomenclature were still in dispute. These specialists would seek to define the types of cancer in terms of actual pathological specimens, which would be kept in special pathological reference centres and placed at the disposal of interested workers throughout the world. The first centre of this kind was opened in 1958.

Non-governmental contributions

It is particularly in the field of the statistics and epidemiology of cancer that some of the most active international co-operation of non-governmental organizations is taking place. The chief of these organizations is the well-

[8] *Epidem. vital Statist. Rep.*, 1952, **5**, 1
[9] *Epidem. vital Statist. Rep.*, 1955, **8**, 211
[10] *Bull. Wld Hlth Org.*, 1955, **12**, 687
[11] *Epidem. vital Statist. Rep.*, 1955, **8**, 81
[12] *Bull. Wld Hlth Org.*, 1956, **15**, 5
[13] *Off. Rec. Wld Hlth Org.*, 1956, **67**, 45

known International Union Against Cancer, with which WHO has established official relationship, and which has lent its full authority to the recommendations on nomenclature, definition and classification. In many of the registration systems outlined above, much support has been given by the national branches of this organization.

One feature of the international study of these conditions which has been specially developed by the International Union Against Cancer in recent years is the examination of geographical variation in the occurrence of different types of cancer. For this purpose, the Union has a Committee on Geographical Pathology which met in 1956 in Kampala and in Leopoldville to discuss the problems of primary cancer of the liver in countries south of the Sahara and the general problems involved in the study of the epidemiology of cancer in this region. A further meeting of the Committee in Leopoldville in October 1959 showed that remarkable progress had been made and was continuing in the ascertainment of the frequency of cancer in several areas of Africa. WHO participated in these meetings with a view to providing assistance in statistical methodology.

There are a variety of other international medical and related bodies which are involved in the international study of cancer. There is, for example, the International Committee on Stage-Grouping in Cancer for the Presentation of the Results of Treatment of Cancer, appointed by the International Congress of Radiology. The work of this Committee was reviewed by a WHO Expert Committee on Health Statistics [14] which considered " that cases of cancer of accessible sites might profitably be grouped under four stages to be more precisely defined for each site:

Stage 1—Tumour strictly confined to the organ and of relatively small size

Stage 2—Tumour limited to the organ of origin but of relatively large size or with limited extension beyond the original organ

Stage 3—Tumour with wide infiltration reaching neighbouring organs

Stage 4—Tumour with considerable involvement of adjacent tissues or having spread to neighbouring organs."

An important contribution was made by the Council for the Co-ordination of International Congresses of Medical Sciences, a special body set up under the joint sponsorship of UNESCO and WHO, in its Symposium on the Geographical Pathology and Demography of Cancer held in Oxford in 1950.[15] This meeting recommended, *inter alia*, that facilities be made available for the exchange of knowledge by workers on similar programmes. Among problems offering useful opportunities for international collaboration were those concerning primary cancer of the liver and cancer of the cervix uteri. The Symposium came out strongly in favour of securing the comparability of published results by the provision in all studies on the frequency of malignant diseases of information concerning the total number of new cases, the population in the area, the percentage of cases, the proportion diagnosed in hospital and the percentage verified by histological or autopsy examination.

The importance of the various non-governmental international organizations to statistical work in the field of cancer cannot be over-emphasized. The ultimate value of international statistical and epidemiological studies of cancer is dependent upon the use by practising physicians, surgeons, radiologists and pathologists of an accepted nomenclature, accepted definitions and an accepted classification in diagnosis, staging and therapy.

[14] *Wld Hlth Org. techn. Rep. Ser.*, 1952, 53, 47

[15] Council for the Co-ordination of International Congresses of Medical Sciences (1951?) *Symposium on Geographical Pathology and Demography of Cancer*, [Paris]

Reports of Expert Groups

Effect of radiation on human heredity *

Most of the attempts that have been made to predict the long-term effects of radiation on human heredity have been based on the results of investigations in animals, as opportunities for studies in human populations are limited. There are, however, a number of widely scattered areas in which the level of natural background radiation is well above that in other parts of the world, and properly planned studies of the populations in such areas could make significant contributions to knowledge of the genetic and somatic effects of prolonged exposure to low levels of radiation. The recently published report of the WHO Expert Committee on Radiation [1] surveys the known areas of high-background radiation and sets out the principles of planning investigations of such areas. From the survey it emerges that the Kerala area, at the southernmost extremity of the west coast of India, is probably the only area now known which might be profitably investigated, and the last part of the report is devoted to the application of the general principles to the planning of what is called " the Kerala project ".

The report enumerates the various factors determining the significance of studies of this type and discusses their bearing on the kind of information that should be collected. It points out that the comparison of specific mutant phenotypes in the irradiated and control populations will rarely be feasible, and that reliance will usually have to be placed on a comparison of populations with respect to those characteristics that are assumed to reflect the cumulative effect of mutation at many loci. The inter-relationship between genetic studies and work which might be undertaken on the somatic effects of radiation is also considered.

The statistical aspects of the proposed studies are examined, with regard both to the evaluation of their possible biological significance, and to the analysis of the data accumulated. A number of suggestions are also made concerning information to be collected in the Kerala project, with particular reference to the *ad hoc* census that would have to be the first step in any such study; and a brief section of the report is devoted to the estimated requirements in men and material.

* WHO Expert Committee on Radiation (1959) *First report: Effect of radiation on human heredity (Wld Hlth Org. techn. Rep. Ser.*, No. 166), Geneva, 47 pages. Price: 3/6, $0.60, Sw. fr. 2.—. Also published in French and Spanish.

[1] Members of the Committee: Professor J. A. Böök, Sweden; Dr J. C. Bugher, USA; Professor L. Cavalli-Sforza, Italy; Professor A. Franceschetti, Switzerland (Vice-Chairman); Dr A. R. Gopal-Ayengar, India; Professor J. V. Neel, USA (Chairman); Dr W. J. Schull, USA (Rapporteur); Dr A. C. Stevenson, United Kingdom. Representative of the United Nations Scientific Committee on the Effects of Atomic Radiation: Dr R. K. Appleyard. Secretariat: Dr I. S. Eve, WHO (Secretary); Dr R. L. Dobson, WHO; Dr P. Dorolle, WHO; Dr V. R. Khanolkar, India (Consultant); Dr D. Klein, Switzerland (Consultant).

Notes and News

A new molluscicide

The expansion of irrigation schemes in East Africa makes it necessary to have a cheap and effective molluscicide to eliminate the vectors of bilharziasis.

A new molluscicide, Bayer 73 (2-hydroxy-5, 2-dichloro-4 nitro-benzanilide), was reported in 1958 to the International Congress on Tropical Medicine. It has now been tested in East Africa, both in field conditions and in the laboratories of the Colonial Pesticides Research Unit, Arusha, Tanganyika, and the Division of Insect-Borne Diseases, Nairobi, Kenya. The main snails concerned were species of *Biomphalaria*, *Bulinus* and *Limnaea*.

In a paper shortly to be published in the WHO Bulletin, R. Foster, C. Teesdale & G. F. Poulton, of these laboratories, give information on the method of application of Bayer 73 and on sampling techniques used to assess the results.

While about 20% of *Bulinus tropicus* survived in the laboratory at a concentration of 1 p.p.m. (part per million), no specimens of this species were found in a river treated with the same concentration. If it can be confirmed that the destruction of the molluscs is as complete as these first trials suggest, Bayer 73 is a product with a future. It acts on both adults and eggs over a minimum distance of 3 miles from the point of application. It does not cause snails to leave the water, and is not affected by the presence of vegetation. Its toxicity for animals and plants is very low. If—as seems possible—the concentration can be reduced to less than 1 p.p.m. without lessening its molluscicidal effectiveness, it may eventually be possible to control snails with a dosage not toxic to fish.

One month after treatment, however, a sudden re-population of the river by *Limnaea natalensis* was observed, and two weeks later two small specimens of *Biomphalaria pfeifferi* were found. No reappearance of *B. tropicus* was noted at that stage. It is possible that some *L. natalensis* were present in the treated area throughout the observations, but remained undetected. It may be supposed that the destruction of predators on the eggs hastened the re-population. This example shows that, if total eradication is not achieved, the few remaining snails may rapidly create new populations because of their high biological potential. The greatest caution should therefore be observed in assuming the disappearance of a snail species simply because no specimens have been trapped or found in hand searches.

Non-specific inhibitors in influenza diagnosis

The haemagglutination-inhibition test—considered by many research workers to be the best method of detecting influenza antibody—may be falsified by the presence of non-specific inhibitors in the serum examined. As this test is used for the immediate and retrospective diagnosis of influenza and in epidemiological research among both humans and animals suspected of harbouring the virus, it is important to make sure that the validity of the results is not affected by this source of error. A number of different methods of inactivating inhibitors have been successively developed over the past fifteen years, each seeking to rectify the faults and inadequacies of earlier methods: treatment by simple heating, potassium or sodium periodate, RDE (receptor-destroying enzyme) obtained from extracts of *V. cholerae* culture, and trypsin. Each of these methods has been found to be inadequate, some inhibitors being destroyed but not others. Thus, during the 1957-58 pandemic, RDE, which had previously been considered very effective, was found to be incapable of destroying all the non-specific inhibitors to which a great number of virus strains—called " avid "—were particularly sensitive. Non-specific inhibitors were not only resistant to simple heating, but their titre increased more than eightfold when they were subjected to it. Potassium periodate was recommended as the best method for the destruction of all the inhibitors in animal sera, but its action has been found not to be uniform.

In an article shortly to be published in the *Bulletin of the World Health Organization*, R. Ananthanarayan & C. K. Jayaram Paniker study the reactions of human sera (from the acute phase and convalescence) and sera of eight animal species with various strains of influenza virus. They conclude that there are qualitative and quantitative differences between the serum inhibitors in the various animal species. The sera from some species have no inhibitors to certain strains—for instance, calf, sheep and fowl sera to Shope 15 (swine influenza), and fowl sera to strain FM1. No single method of getting rid of all the inhibitors at once exists. It is therefore suggested that different techniques should be tested, and perhaps combined—periodate and trypsin, in particular, might be tried with changes in concentration and times of action.

The reaction of the inhibitors to periodate and to trypsin appears to indicate that they belong to the class of mucopolysaccharides and mucoproteins. Electrophoretic studies show that there are differences in inhibitors to different strains in the same serum and that the inhibitor pattern to

the same strain varies in different species of sera. Further tests with large numbers of sera are recommended.

Resistance of gonococcus strains to penicillin

Gonococcus strains isolated in 1944 were found to be highly sensitive to penicillin. From 1946 onwards, the existence of less sensitive strains was observed. Up to the end of 1955, however, doses of penicillin twice to four times as great as those which were effective against the strains isolated in 1944 were enough to stop the development of the less sensitive strains isolated at the Statens Seruminstitut, Copenhagen. Then, from a case of gonorrhoea without complications, four strains were isolated which were found to be only one-twentieth as sensitive as the 1944 strains. This discovery and the fact that the incidence of gonorrhoea remained about the same in spite of penicillin therapy suggested that further research on the subject was called for. In a paper to be published in a forthcoming number of the WHO Bulletin, Alice Reyn & M. W. Bentzon summarize their earlier research in this field and discuss their investigations during 1957 and 1958. Some of their findings are given below.

A comparison of several hundred recently isolated gonococcus strains with a hundred strains isolated in 1944 has shown that, for inhibition, about 25% of the strains sent to the laboratory for diagnosis in 1957 required doses of penicillin 20 times greater than had been needed for most strains originally.

Twenty strains showing reduced sensitivity to penicillin were subcultured for 30 to 90 days on a medium without penicillin, without any increase in sensitivity being produced.

Both in 1957 and in 1958, some 200 strains were tested for penicillin sensitivity by the tablet method, i.e., by placing penicillin tablets in the culture medium and measuring the zone of inhibition round them. The zone diameters varied between 20 and 50 mm. In both years, about 39% of the strains showed reduced sensitivity, i.e., zone diameters of 34 mm or less. In 1958, however, the number of strains with zone diameters of 44 mm or more was significantly lower than in 1957, which seems to indicate that the selection (and induction) of the strains with a comparatively reduced penicillin sensitivity continues.

None of the 1957 strains was completely resistant to streptomycin, but two of the 1958 strains (from the same patient) were.

In both the 1957 and 1958 strains a significant positive correlation was observed between sensitivity to penicillin and sensitivity to streptomycin.

From June 1957 onwards, atypical gonococcus strains—most of them sensitive to penicillin—appeared in the cultures. The growth of these strains on the routine media is poor; they require special conditions for culture and are able to ferment glucose only weakly or not at all. Serological examination showed them to be distinguished from normal strains by the frequent presence of anti-complementary antigens. The proportion of atypical strains rose to 40% in January 1958 and this level was maintained until May 1958 when the culture and fermentation media were changed. The change of culture medium had yet another effect: the inhibition zones of the atypical strains—and of these alone—were greater on ox-heart broth than on ox-meat broth. This phenomenon has not yet been explained. It is possible that the emergence of atypical strains is related to the mode of action of the penicillin.

Developments in insecticide resistance

Since the beginning of 1958, resistance to insecticides has appeared in a further 16 species, 14 of which are anophelines. For 14 other species both the geographical distribution of resistant populations and the types of resistance encountered have increased. This dangerous situation has led WHO to call for intensified research on the subject.

In an article shortly to be published in the WHO Bulletin, Don W. Micks reviews developments in the situation in 1958 and 1959. He first gives details on the growth of insecticide resistance, species by species, and then reviews developments in research. In 13 of the anopheline

species that have developed resistance in the period under review, this resistance is to dieldrin only. There is convincing evidence that resistance is brought about by selection pressure. Research on cross-resistance to various types of insecticide and on the genes responsible for the inheritance of resistance has continued. Thus the dominant factor for phenylurea (PU) resistance in a strain of *Drosophila* has been traced to the same locus on the second chromosome as that which confers resistance to DDT, BHC and parathion, as well as unusual susceptibility to phenylthiourea (PTU). The dominant gene at locus 50 on the third chromosome which confers resistance to nicotine sulfate also confers resistance to PU and PTU. On the basis of these findings, an insecticide was prepared containing the minimum amount of PTU needed to kill DDT-resistant strains, and the minimum amount of DDT required to kill PTU-resistant strains. With this combination all the resistant strains in the fly population concerned were killed. Selection pressure with PTU removed the resistance to DDT, BHC and parathion. Combined PTU and PU produced flies resistant to nicotine sulfate.

Food colouring agents

A joint FAO/WHO Expert Committee on Food Additives met in Rome from 30 November to 5 December 1959 to consider specifications for a certain number of natural and synthetic food colouring agents in use in various countries throughout the world. Of the 43 colouring agents reviewed, 26 are organo-synthetic, 13 natural and 4 inorganic. Among the topics discussed were the maximum allowable concentrations of components other than the main compound, and specifications for dye content in the commercial manufacture of colouring agents. Natural food colourings contain a large percentage of poorly defined components about which toxological information is meagre. Extraction and preparation in relatively pure forms or synthetic production of these colouring agents would make it easier to decide how safe they are. In addition to specifications, the Committee discussed the identification and assay of the dyes, often a difficult task.

An account of the Joint Committee's work will be published in the *WHO Chronicle* when its report appears.

Education and training in nutrition

A Symposium on Education and Training in Nutrition was held jointly by FAO and the WHO Regional Office for Europe, from 2 to 11 December 1959, at Bad Homburg, Germany. It was attended by 60 participants from 22 European countries and from Israel and Tunisia.

While undernutrition in Europe is no longer such a problem as it was only a few years ago, malnutrition in varying degrees still exists in many European countries. Rickets, protein malnutrition and pellagra—not to mention overnutrition—are still important problems. The diets of mothers and children, of the elderly, and of the sick and disabled need to be improved in many respects. The Symposium stressed the need for further investigations on food consumption and the state of nutrition in Europe, to provide a basis for national food policies and education programmes. These investigations would take into account economic, cultural and social factors influencing food habits. It also advocated that institutes be set up to conduct laboratory and applied research, and provide training in the scientific and applied aspects of nutrition.

In the opinion of the Symposium, all medical students, physicians, public health doctors and nurses should take courses on nutrition. It was pointed out that the nutrition courses given in many universities could be improved; in particular, nutrition should be taught as a practical subject related to the everyday problems of family life. Those responsible for building or expanding nutrition institutions should have opportunities of visiting good examples of such institutions in other countries, and increasing use should be made of certain national nutrition centres to train workers from Europe and from other regions of the world.

Vaccination for travellers

Under the International Sanitary Regulations a health authority may require certificates of vaccination against cholera, smallpox and yellow fever from international travellers. A booklet entitled *Vaccination Certificate Requirements for*

International Travel, recently published by WHO, lists requirements in this respect for some 180 countries and territories as on 15 December 1959. This publication is bilingual (English and French) and costs 13s.4d., $2.75, or Sw.fr. 8.—. Purchasers will be kept informed by WHO of any changes in the requirements that occur during the following year.

People and Places

Radiation protection

Dr Harold J. Ham, of Australia, has been appointed WHO consultant to the Governments of Burma and Thailand on radiation hazards and protective measures in this field. He will spend approximately two months in these countries, lecturing to staffs of health administrations, medical colleges and hospitals, advising on methods of radioactive waste disposal, and suggesting ways and means of minimizing radiation hazards. He will also examine X-ray installations. To permit him to make any radiation surveys that may seem indicated, he has been supplied with an EIL portable X-ray dosimeter, together with one 35-ml and one 350-ml ionization chamber.

Dr Ham is senior radiotherapist at two leading hospitals in Sydney, a member of two Standing Committees of the Australian National Health and Medical Research Council dealing with radiation, and Chairman of the New South Wales Therapeutic Trials Committee. In 1959, he was appointed Vice-President of the College of Radiologists of Australasia.

Rural health and community development

As part of its community development programme, the Government of India is expanding health services and training health personnel in a number of areas, with help from WHO and UNICEF. WHO has appointed Dr M. A. Shammas as Chief Public Health Officer to the health programme in the State of Uttar Pradesh. This programme, like similar programmes in other States, aims at integrating rural health services into the over-all community development programme.

A graduate of the Medical School of the American University, Beirut, Lebanon, Dr Shammas obtained his D.P.H. degree at the London School of Hygiene and Tropical Medicine. He has experience of public health work in Jordan and Libya, and for the last twelve years he has been Medical Officer of Health in Nazareth, Israel.

Health evaluation in Israel

Dr Karl Evang, Director-General of Public Health, Norway, recently went for two months to Israel, on behalf of WHO, to help the Ministry of Health develop a national health evaluation programme. The immediate purpose of the programme is to analyse the health achievements of the Government of Israel since 1951 when a health teaching mission, sponsored jointly by WHO and the Unitarian Service Committee, visited the country under Dr Evang's chairmanship.

Dr Evang has been associated with WHO since its foundation and was President of the Second World Health Assembly.

Nutrition

Dr G. R. Wadsworth has been appointed nutrition adviser to the WHO Regional Office for the Western Pacific. He will help governments to plan national nutrition programmes, assess the needs for nutrition personnel, and organize appropriate training. He will also be responsible for the supervision and evaluation of the nutrition projects in the Region, for the maintenance of co-operation with other interested agencies, such as FAO and UNICEF, and for acting as liaison officer between the Regional Office and Headquarters on all matters related to nutrition.

A graduate of the University of Liverpool, Dr Wadsworth was on the staff of the Human Nutrition Unit of the London School of Hygiene and Tropical Medicine prior to his appointment

with WHO. He has had considerable experience of nutrition work in Africa and Asia.

Health and housing

WHO and other specialized agencies are co-operating with the United Nations in a joint programme concerned with low-cost housing and related community facilities. Dr William S. Parker, of the United Kingdom, is helping WHO to determine the extent and scope of its participation.

A graduate of Manchester University, Dr Parker has for many years been Medical Officer of Health for Brighton, England. In this capacity he has been closely associated with the solution of urgent housing problems.

Tuberculosis control in Somalia

Dr Alvez de Souza has been appointed leader of a WHO tuberculosis control team in Somalia. He will help the Government to plan and organize control activities, collect epidemiological information, establish a mobile X-ray unit, train tuberculosis workers, and organize tuberculin-testing and BCG vaccination. The team will work in a tuberculosis centre now being built in Mogadiscio. Born in Brazil, Dr Alvez de Souza is of Portuguese nationality and received his medical education in Lisbon. He has wide experience of tuberculosis work in Brazil, Portugal and Switzerland.

Reorganization of Lisbon Institute of Hygiene

The Government of Portugal is planning to set up a regular school of public health at the Institute of Hygiene in Lisbon, and to reorganize the Institute generally. Professor Paul Antunes, of Brazil, is acting as WHO consultant to the Government in this connexion. Professor Antunes has been successively Director-General of Health and Secretary of Health in the State of São Paulo, Brazil, and was at one time Dean of the School of Hygiene and Public Health, University of São Paulo.

Health education in India

Professor Dorothy Nyswander, of the United States, has been appointed WHO consultant at the All-India Institute of Hygiene and Public Health, Calcutta, for a period of three months. In this capacity she will help with the further development of the training courses in health education given at the Institute.

Professor Nyswander was for several years Professor of Health Education at the School of Public Health, University of California, Berkeley.

Malaria appointment

Dr Fang-Chin Tsai, formerly of the Hong Kong Public Health Service, has been appointed medical officer on the WHO team which is undertaking a malaria survey in the Republic of Korea as a preliminary to malaria eradication operations.

Dr Tsai joined WHO in 1957 and served for two years as medical officer in charge of malaria eradication in Afghanistan. He obtained his medical degree from Pei-Yang Medical School, Tientsin, China, took post-graduate courses in malariology and plague control in Calcutta and Bombay, and holds the degree of Master of Public Health from Johns Hopkins University, Baltimore, Md.

Review of WHO Publications

Epidemiological Methods in the Study of Mental Disorders, by D. D. Reid, Geneva, 1960 (*Publ. Hlth Pap.*, No. 2), 73 pages. Price: 5/—, $1.00, or Sw.fr. 3.—. French edition in preparation.

Epidemiology, as that branch of medical science which studies the factors influencing the incidence and prevalence of disease and its effects on the community rather than on the individual, has in the past been concerned mainly with infectious diseases. Its field of application, however, is being steadily extended. In this paper epidemiological methods are applied to mental disorders, with the aim of displaying not only their potential value but also their limitations. The examples chosen illustrate

the practical problems encountered in the design, conduct, and interpretation of epidemiological studies of mental disorders, and the subjects discussed include the use of vital statistics, the measurement of mental morbidity and of personal predisposition towards mental disorder, the conduct and pitfalls of surveys of the prevalence of mental disorders, the assessment of genetic and environmental factors, the technical aspects of such field procedures as sampling, case-finding, assessment of validity and reliability, etc. and the carrying out of epidemiological experiments in the control of mental disease.

This is not intended to be a textbook of psychiatric epidemiology, but an outline of the general principles governing the use of epidemiological methods in psychiatry. The text was drafted with the collaboration of Drs Jan Böök, Ernest Gruenberg and E.E. Krapf and has benefited from the suggestions of the experts attending the Joint Technical Meeting on Epidemiological Method in Psychiatry held in London in September 1958 under the sponsorship of WHO, the Milbank Memorial Fund, the Medical Research Council of Great Britain, and the World Federation for Mental Health. The author, who is Reader in Epidemiology and Vital Statistics at the London School of Hygiene and Tropical Medicine, hopes that it will command the agreement of experienced workers and lead to the greater comparability of studies in different parts of the world.

CORRIGENDUM

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